# TBD07 – (Part 07) ****Enzymes****

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. B.7.1 **Describe** the characteristics of biological catalysts (enzymes). (2) Include: enzymes are proteins; activity depends on tertiary and quaternary structure; and the specificity of enzyme action.
   1. What does an enzyme do?
   2. Explain what a substrate is:
   3. Explain what the active site is:
   4. How are enzymes specific?
2. B.7.2 **Compare** inorganic catalysts and biological catalysts (enzymes). (3)

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|  | **Inorganic Catalysts** | **Biological (enzyme) Catalysts** |
| **Environment Necessary** |  |  |
| **Function** |  |  |

1. B.7.3 **Describe** the relationship between substrate concentration and enzyme activity. (2)
   1. How is enzyme activity measured? What are the units?
   2. What happens at low substrate concentrations? What’s the order?
   3. What happens as substrate concentration is increased? What’s the order?
   4. What happens when substrate concentration no longer has an effect on the rate? What’s the order?
   5. Draw a diagram of enzyme activity vs substrate concentration. Label, Vmax, Vmax/2, Km­, and axis:
2. B.7.4 **Determine** Vmax and the value of the Michaelis constant (Km) by graphical means and explain its significance. (3)
   1. What happens to the relative number of active sites and substrate molecules as the substrate concentration is increased? This should agree with your responses to B.7.3.
   2. The Michaelis Menten Theory assumes what process occurs? What are the equations that coincide?
   3. Explain Vmax/2 and the Michaelis constant, Km:
   4. Use the lock and key model to demonstrate specificity:
3. B.7.5 **Describe** the mechanism of enzyme action, including enzyme substrate complex, active site and induced fit model. (2)
   1. Using the equation given, describe (or diagram) the process of enzyme action:
   2. What is the induced fit model and how is it different than the lock and key model?
4. B.7.6 **Compare** competitive inhibition and non-competitive inhibition. (3)

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|  | **Competitive Inhibition** | **Non-competitive Inhibition** |
| **Diagram of active site** |  |  |
| **Information regarding Inhibition** |  |  |
| **Graph of enzyme activity vs substrate concentration** |  |  |

1. B.7.7 **State and explain** the effects of heavy metal ions, temperature changes and pH changes on enzyme activity. (3)

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|  | **Information regarding change** | **Graph of change in factor** |
| **Temperature** |  |  |
| **Heavy metal ions** |  |  |
| **Acidity (pH)** |  |  |